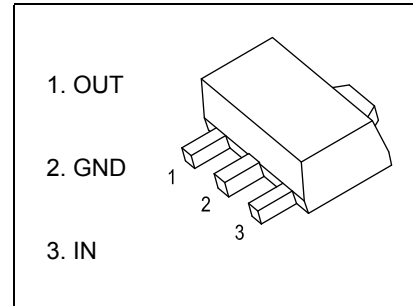


**SOT-89 Plastic-Encapsulate Voltage Regulators**
**78L05** Three-terminal positive voltage regulator

**SOT-89-3L**
**FEATURES**

- Maximum output current  
 $I_{OM}$ : 0.1A
- Output voltage  
 $V_O$ : 5V
- Continuous total dissipation  
 $P_D$ : 0.6 W ( $T_a = 25^\circ\text{C}$ )

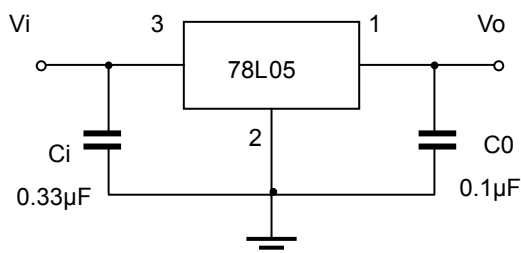
**MARKING** : MDD 78L05

**ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)**

| Parameter                                   | Symbol          | Value    | Unit                      |
|---|-----------------|----------|---------------------------|
| Input Voltage                               | $V_i$           | 30       | V                         |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 160      | $^\circ\text{C}/\text{W}$ |
| Operating Junction Temperature Range        | $T_{OPR}$       | -40~+125 | $^\circ\text{C}$          |
| Storage Temperature Range                   | $T_{STG}$       | -65~+150 | $^\circ\text{C}$          |

**ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE ( $V_i=10\text{V}, I_o=40\text{mA}, C_i=0.33\mu\text{F}, C_o=0.1\mu\text{F}$ , unless otherwise specified)**

| Parameter                | Symbol       | Test conditions   | Min                    | Typ  | Max | Unit              |   |
|--------------------------|--------------|---|------------------------|------|-----|-------------------|---|
| Output voltage           | $V_o$        |   | 25 $^\circ\text{C}$    | 4.80 | 5.0 | 5.20              | V |
|                          |              |   |                        | 4.85 | 5.0 | 5.15              | V |
|                          |              | $7\text{V} \leq V_i \leq 20\text{V}, I_o=1\text{mA} \sim 40\text{mA}$ | 0-125 $^\circ\text{C}$ | 4.90 | 5.0 | 5.10              | V |
|                          |              |   |                        | 4.75 | 5.0 | 5.25              | V |
| Load Regulation          | $\Delta V_o$ | $I_o=1\text{mA} \sim 100\text{mA}$                                    | 25 $^\circ\text{C}$    | 15   | 60  | mV                |   |
|                          |              | $I_o=1\text{mA} \sim 40\text{mA}$                                     | 25 $^\circ\text{C}$    | 8    | 30  | mV                |   |
| Line regulation          | $\Delta V_o$ | $7\text{V} \leq V_i \leq 20\text{V}$                                  | 0-125 $^\circ\text{C}$ | 32   | 150 | mV                |   |
|                          |              | $8\text{V} \leq V_i \leq 20\text{V}$                                  | 25 $^\circ\text{C}$    | 26   | 100 | mV                |   |
| Quiescent Current        | $I_q$        |   | 25 $^\circ\text{C}$    | 3.8  | 6   | mA                |   |
| Quiescent Current Change | $\Delta I_q$ | $8\text{V} \leq V_i \leq 20\text{V}$                                  | 0-125 $^\circ\text{C}$ |      | 1.5 | mA                |   |
|                          |              | $1\text{mA} \leq I_o \leq 40\text{mA}$                                | 0-125 $^\circ\text{C}$ |      | 0.1 |                   |   |
| Output Noise Voltage     | $V_N$        | $10\text{Hz} \leq f \leq 100\text{KHz}$                               | 25 $^\circ\text{C}$    | 42   |     | $\mu\text{V}/V_o$ |   |
| Ripple Rejection         | RR           | $8\text{V} \leq V_i \leq 20\text{V}, f=120\text{Hz}$                  | 0-125                  | 41   | 49  | dB                |   |
| Dropout Voltage          | $V_d$        |   | 25 $^\circ\text{C}$    | 1.7  |     | V                 |   |

\* Pulse test.

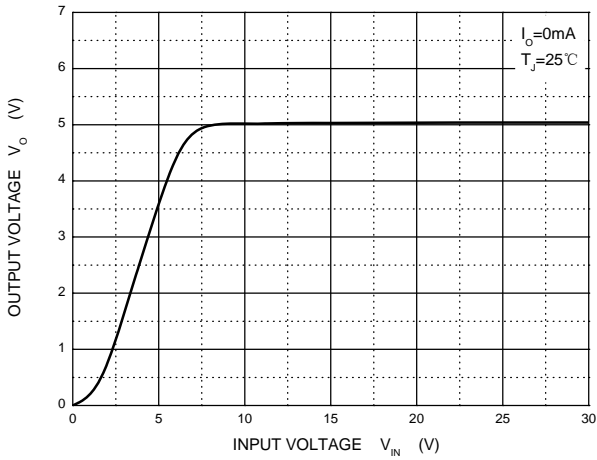
**TYPICAL APPLICATION**


Note: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as

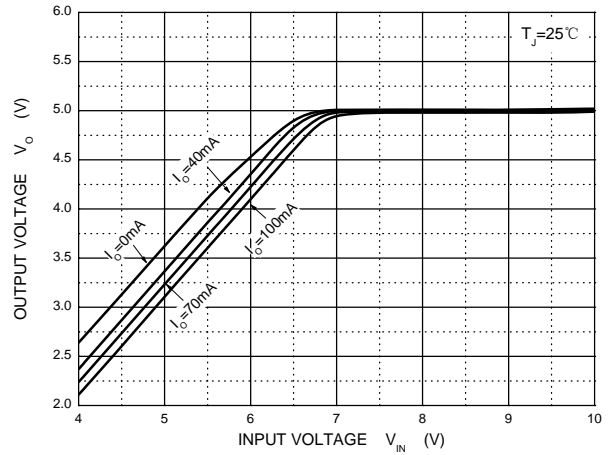
The above data are for reference only.

Typical Characteristics

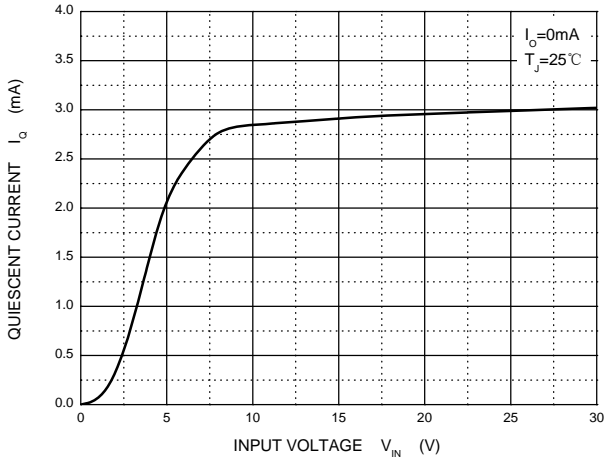
Output Characteristics



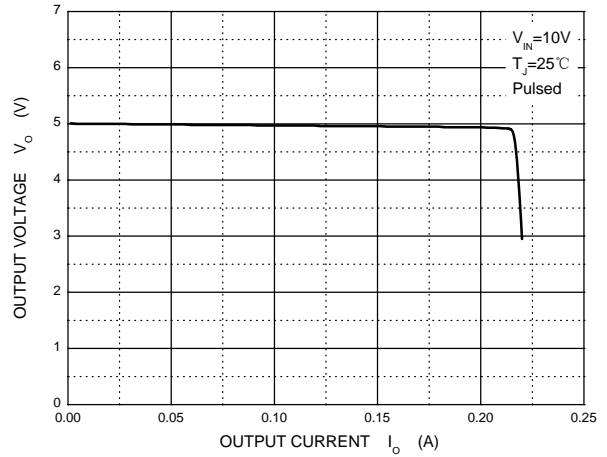
Dropout Characteristics



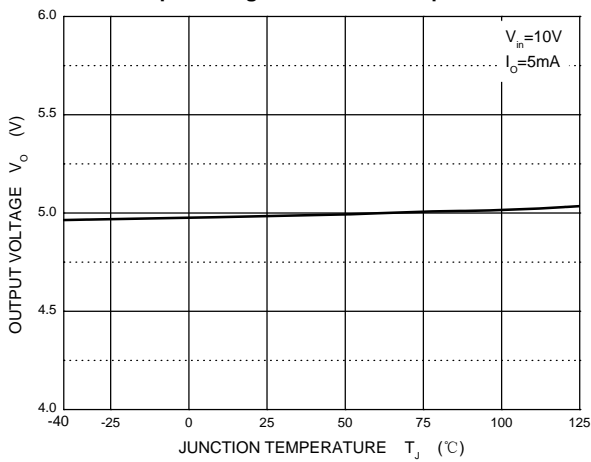
Quiescent Current vs Input Voltage



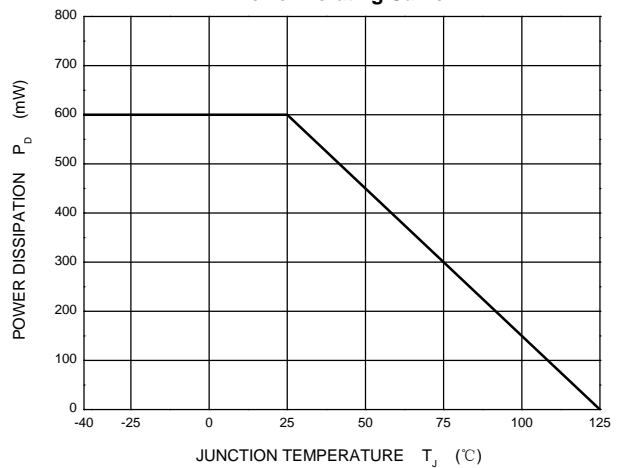
Current Cut-off Grid Voltage



Output Voltage vs Junction Temperature

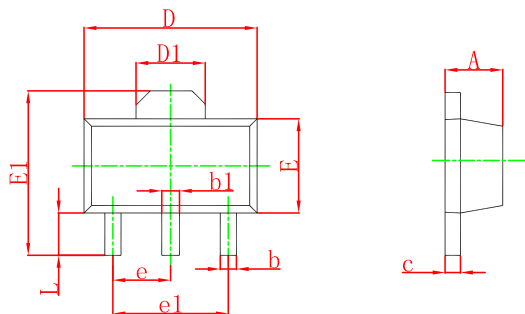


Power Derating Curve



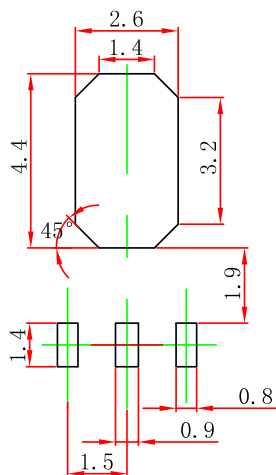
**Outline Drawing**

**SOT-89-3L Package Outline Dimensions**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.400                     | 1.600 | 0.055                | 0.063 |
| b      | 0.320                     | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                     | 0.580 | 0.016                | 0.023 |
| c      | 0.350                     | 0.440 | 0.014                | 0.017 |
| D      | 4.400                     | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF.                |       | 0.061 REF.           |       |
| E      | 2.300                     | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                     | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP.                |       | 0.060 TYP.           |       |
| e1     | 3.000 TYP.                |       | 0.118 TYP.           |       |
| L      | 0.900                     | 1.200 | 0.035                | 0.047 |

**SOT-89-3L Suggested Pad Layout**



Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: ±0.05mm.
3. The pad layout is for reference purposes only.

**PACKAGE SPECIFICATIONS**

| Package   | Reel Size | Reel DIA. (mm) | Q'TY/Reel (pcs) | Box Size (mm) | QTY/Box (pcs) | Carton Size (mm) | G.W.(Kg) |
|-----------|-----------|----------------|-----------------|---------------|---------------|------------------|----------|
| SOT-89-3L | 7'        | 330            | 1000            | 203×203×195   | 40000         | 438×438×220      | 180000   |